

Comparison of Flow and Mixing Characteristics between Non-Oscillating and Transversely Oscillating Jet

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Abstract : Comparison of flow and mixing characteristics between non-oscillating jet and transversely oscillating jet was investigated experimentally. Flow evolution process was detected by using high-speed digital camera, and jet spread width was calculated using binary edge detection techniques by using the long-exposure images. The velocity characteristics of transversely oscillating jet induced by a V-shaped fluidic oscillator were measured using single component hot-wire anemometer. The jet spread width of non-oscillating jet was much smaller than the jet exit gap because of behaving natural jet behaviors. However, the transversely oscillating jet has a larger jet spread width, which was associated with the excitation of the flow by self-induced oscillation. As a result, the flow mixing characteristics desperately improved both near-field and far-field. Therefore, this transversely oscillating jet has a better turbulence intensity, entrainment, and spreading width so that it augments flow-mixing characteristics desperately.

Keywords : flow mixing, transversely oscillating, spreading width, velocity characteristics

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